REMARKS

In the non-final Office Action, the Examiner rejects claims 1-3, 5, 6, and 14-22 under 35

U.S.C. § 103(a) as unpatentable over CHANDRAN (U.S. Patent No. 6,801,500) in view of FAN

et al. (U.S. Patent No. 6,408,005); rejects claims 7-10, 12, and 13 under 35 U.S.C. § 103(a) as

unpatentable over CHANDRAN in view of FAN et al., and further in view of TROXEL (U.S.

Patent No. 6,185,210); rejects claim 4 under 35 U.S.C. § 103(a) as unpatentable over

CHANDRAN in view of FAN et al., and further in view of TROXEL, and in view of Applicants'

admitted prior art; and rejects claim 11 under 35 U.S.C. § 103(a) as unpatentable over

CHANDRAN in view of FAN et al., and further in view of TROXEL and in view of

MAKRUCKI (U.S. Patent No. 6,208,622). Applicants respectfully traverse these rejections.

Claims 1-22 remain pending.

Claims 1-3, 5, 6, and 14-22 stand rejected under 35 U.S.C. § 103(a) as allegedly

unpatentable over CHANDRAN in view of FAN et al. Applicants respectfully traverse.

Independent claim 1, for example, recites a method for allocating bandwidth in a network

appliance, where the network appliance includes a plurality of guaranteed bandwidth buckets

used to evaluate when to pass traffic through the network appliance. The method includes

providing a shared bandwidth bucket associated with a plurality of the guaranteed bandwidth

buckets; allocating bandwidth to the shared bandwidth bucket based on the underutilization of

bandwidth in the plurality of guaranteed bandwidth buckets; and sharing excess bandwidth

developed from the underutilization of the guaranteed bandwidth allocated to the individual

guaranteed bandwidth buckets including borrowing bandwidth from the shared bandwidth bucket

by a respective guaranteed bandwidth bucket to allow traffic to pass immediately through the

network appliance. CHANDRAN and FAN et al. do not disclose or suggest this combination of features.

For example, CHANDRAN and FAN et al. do not disclose or suggest providing a shared bandwidth bucket associated with a plurality of the guaranteed bandwidth buckets. The Examiner relies on col. 4, lines 43-51, of CHANDRAN for allegedly disclosing this feature (Office Action, pg. 2). Applicants disagree.

At col. 4, lines 43-51, CHANDRAN discloses:

> The data flow has certain characteristics that can be conveniently represented by a reserved rate token bucket and a peak rate token bucket. These token buckets track usage of network bandwidth in relation to the reserved and peak rates allocated to the subscriber of the data flow. A third token bucket, an interface token bucket, represents the capacity of the entire network device interface and the physical line associated with the network device.

This section of CHANDRAN discloses that a data flow can be associated with a reserved rate token bucket and a peak rate token bucket. This section of CHANDRAN further discloses that an interface token bucket represents the capacity of the entire network device interface and the physical line associated with the network device. Applicants assume that the Examiner relies on CHANDRAN's interface token bucket as allegedly corresponding to the recited shared bandwidth bucket. Neither this section of CHANDRAN nor any other section of CHANDRAN discloses or suggests, however, that the interface token bucket is a shared bandwidth bucket, as required by claim 1. CHANDRAN in no way discloses or suggests that the interface token bucket is shared by the reserved rate token bucket and the peak rate token bucket or by other token buckets. If this rejection is maintained, Applicants request that the Examiner specifically point out where in CHANDRAN it is disclosed that the interface token bucket, or the reserved rate or peak rate token bucket, is a shared bandwidth bucket. FAN et al. also does not disclose or

suggest shared buckets. Therefore, FAN et al. cannot disclose the above feature of claim 1.

Since CHANDRAN does not disclose or suggest providing a shared bandwidth bucket associated with a plurality of the guaranteed bandwidth buckets, CHANDRAN cannot disclose allocating bandwidth to the shared bandwidth bucket based on the underutilization of bandwidth in the plurality of guaranteed bandwidth buckets, as also required by claim 1. The Examiner relies on col. 5, line 61, to col. 6, line 7, of CHANDRAN for allegedly disclosing allocating bandwidth to the shared bandwidth bucket (Office Action, pg. 3). The Examiner admits that CHANDRAN does not disclose based on the underutilization of bandwidth in the plurality of guaranteed bandwidth buckets and relies on col. 5, lines 39-54, of FAN et al. for allegedly disclosing this piece of the above feature of claim 1 (Office Action, pg. 3). Applicants object to the Examiner's piecemeal examination of the above feature of claim 1.

Applicants' claim 1 recites allocating bandwidth to the shared bandwidth bucket based on the underutilization of bandwidth in the plurality of guaranteed bandwidth buckets. Instead of addressing this entire feature, the Examiner breaks the feature down into illogical parts and points to sections of CHANDRAN and FAN et al. that allegedly disclose each of the individual parts. That is, instead of addressing allocating bandwidth to the shared bandwidth bucket based on the underutilization of bandwidth in the plurality of guaranteed bandwidth buckets, the Examiner points to a section of CHANDRAN that allegedly discloses allocating bandwidth to the shared bandwidth bucket and a section of FAN et al. that allegedly discloses based on underutilization of bandwidth in the plurality of guaranteed bandwidth buckets, but fails to specifically point out where in CHANDRAN or FAN et al. this entire feature is disclosed. Applicants submit that the Examiner has not provided a proper rejection with respect to this

feature of Applicants' claim 1.

At col. 5, line 61, to col. 6, line 7, CHANDRAN discloses:

For example, suppose in one embodiment of the invention the interface token bucket is refreshed at a rate of 800 tokens every second, with each token representing 1 bit, to give the network device a bandwidth of 800 bits per second. Suppose also that the four flows shown in FIG. 1 each have a reserved rate of 200 bits per second and peak rates of 300 bits per second. At each one second interval, the interface token bucket would be refreshed with 800 tokens. Each reserved token bucket 103 would then be refreshed with 200 tokens and each peak token bucket 105 would be refreshed with 300 tokens. Sometimes the various data flows will have different reserved rates. For example, one may be allotted 300 bits per second of reserved rate and another 100 bits per second of reserved rate.

This section of CHANDRAN discloses that interface token bucket 101, reserved token bucket 103, and peak token bucket 105 can be refreshed. This section of CHANDRAN does not disclose or suggest that interface token bucket 101, reserved token bucket 103, or peak token bucket 105 is a shared bandwidth bucket. Therefore, this section of CHANDRAN cannot disclose or suggest allocating bandwidth to a shared bandwidth bucket based on the underutilization of bandwidth in the plurality of guaranteed bandwidth buckets or, as alleged by the Examiner, allocating bandwidth to the shared bandwidth bucket.

At col. 5, lines 39-54, FAN et al. discloses:

The present invention provides a new scheduling scheme which uses statistical approaches to admission control so as to provide much higher utilizations, while maintaining the guaranteed QoS. The general concept of the present invention is do construct the rate from two components: (1) a minimum guaranteed rate, and (2) a portion of the unused bandwidth. Constructing the rate from two components allows the scheduler to operate under at least three modes: (1) full available rate (i.e., minimum guaranteed rate plus a portion of the unused bandwidth), (2) minimum guaranteed rate, and (3) halt transmission (with very small probability). In its preferred form, inventive scheduling scheme decouples the minimum guaranteed rate from the portion of unused bandwidth and is called Dynamic Rate Control (DC).

This section of FAN et al. discloses a scheduler that operates under at least three modes: (1) a full available rate mode, (2) a minimum guaranteed rate mode, and (3) a halt transmission mode. This section of FAN et al. in no way discloses or suggests allocating bandwidth to a shared bandwidth bucket based on the underutilization of bandwidth in the plurality of guaranteed bandwidth buckets, as required by claim 1. Whether or not the above section of FAN et al. discloses "based on the underutilization of bandwidth in the plurality of guaranteed bandwidth buckets" is irrelevant to examination of the present application since claim 1 does not recite "based on the underutilization of bandwidth in the plurality of guaranteed bandwidth buckets," but instead, recites <u>allocating bandwidth to the shared bandwidth bucket based on the underutilization of bandwidth in the plurality of guaranteed bandwidth buckets</u>. It is unreasonable to ignore the "allocating bandwidth to the shared bandwidth bucket" portion of the above claim feature.

CHANDRAN and FAN et al. do not further disclose or suggest sharing excess bandwidth developed from the underutilization of the guaranteed bandwidth allocated to the individual guaranteed bandwidth buckets including borrowing bandwidth from the shared bandwidth bucket by a respective guaranteed bandwidth bucket to allow traffic to pass immediately through the network appliance, as also required by claim 1. The Examiner admits that CHANDRAN does not disclose this feature and relies on col. 8, lines 10-23, of FAN et al. for allegedly disclosing this feature (Office Action, pg. 3). Applicants disagree.

At col. 8, lines 10-23, FAN et al. discloses:

In the case of a single bottleneck link shared by a set of traffic streams, the inventive DRC provides a minimum rate guarantee for each stream. Streams which do not make full use of their minimum rate guarantees (i.e., streams with input rates less than their minimum rate guarantees) contribute to a pool of excess

bandwidth which is made available to streams which transmit in excess of their minimum rates. In DRC scheduling, the distribution of the excess bandwidth is determined by weights assigned to the streams. In contrast with weighted fair share schedulers, the share of the excess bandwidth which is made available to a stream in the inventive DRC is decoupled from the minimum rate guarantees; i.e., the share of the unused bandwidth need not be proportional to the assigned minimum rate guarantees.

This section of FAN et al. discloses that a pool of excess bandwidth can be made available to streams that transmit in excess of their minimum rates. This section of FAN et al. does not disclose or suggest a shared bandwidth bucket. Therefore, this section of FAN et al. cannot disclose sharing excess bandwidth developed from the underutilization of the guaranteed bandwidth allocated to the individual guaranteed bandwidth buckets including borrowing bandwidth from the shared bandwidth bucket by a respective guaranteed bandwidth bucket to allow traffic to pass immediately through the network appliance, as required by claim 1.

For at least the foregoing reasons, Applicants submit that claim 1 is patentable over CHANDRAN and FAN et al., whether taken alone or in any reasonable combination.

Claims 2, 3, 5, and 6 depend from claim 1. Therefore, these claims are patentable over CHANDRAN and FAN et al., whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 1. Moreover, these claims recite additional features not disclosed or suggested by CHANDRAN and FAN et al.

For example, claim 2 recites that the shared bandwidth bucket is a token bucket. Since CHANDRAN and FAN et al. do not disclose a shared bandwidth bucket, CHANDRAN and FAN et al. cannot disclose the feature of claim 2.

The Examiner relies on col. 4, lines 43-51, of CHANDRAN for allegedly disclosing the above feature of claim 2 (Office Action, pg. 3). Applicants disagree.

Col. 4, lines 43-51, of CHANDRAN is reproduced above. This section of CHANDRAN discloses that a data flow can be associated with a reserved rate token bucket and a peak rate token bucket. This section of CHANDRAN further discloses that an interface token bucket represents the capacity of the entire network device interface and the physical line associated with the network device. CHANDRAN in no way discloses or suggests that interface token bucket is shared by the reserved rate token bucket and the peak rate token bucket or by another other token buckets.

For at least these additional reasons, Applicants submit that claim 2 is patentable over CHANDRAN and FAN et al., whether taken alone or in any reasonable combination.

Independent claim 14 recites features similar to features recited above with respect to claim 1. Therefore, this claim is patentable over CHANDRAN and FAN et al., whether taken alone or in any reasonable combination, for at least reasons similar to reasons given above with respect to claim 1. Moreover, this claim recites defining a guaranteed bandwidth allocation for a first policy for passing traffic through the network appliance including using a first bucket to allocate the guaranteed bandwidth and defining a guaranteed bandwidth allocation for a second policy for passing traffic through the network appliance including using a second bucket to allocate the guaranteed bandwidth. CHANDRAN and FAN et al. do not disclose or suggest these features. The Examiner does not address these features in the Office Action. Therefore, a *prima facie* case of obviousness has not been established with respect to claim 14.

For at least the foregoing reasons, Applicants submit that claim 14 is patentable over CHANDRAN and FAN et al., whether taken alone or in any reasonable combination.

Independent claim 15 recites features similar to features recited above with respect to

claim 1. Therefore, this claim is patentable over CHANDRAN and FAN et al., whether taken alone or in any reasonable combination, for at least reasons similar to reasons given above with respect to claim 1. Moreover, this claim recites other features not disclosed or suggested by CHANDRAN and FAN et al.

For example, claim 15 recites a scheduler operable to evaluate a packet to determine if a traffic shaping policy should be applied to a given packet. CHANDRAN and FAN et al. do not disclose or suggest this feature. The Examiner does not address this feature in the Office Action. Therefore, a *prima facie* case of obviousness has not been established with respect to claim 15.

For at least the foregoing reasons, Applicants submit that claim 15 is patentable over CHANDRAN and FAN et al., whether taken alone or in any reasonable combination.

Independent claim 16 recites a first bucket configured to store tokens; a second bucket configured to store tokens; and a scheduler configured to determine if a size of traffic received at the network device exceeds a number of tokens stored in the first bucket, and transfer, when the size of the traffic exceeds the number of tokens stored in the first bucket, an appropriate number of tokens from the second bucket to the first bucket so that the first bucket includes a number of tokens that equals or exceeds the size of the traffic. CHANDRAN and FAN et al. do not disclose or suggest this combination of features.

For example, CHANDRAN and FAN et al. do not disclose or suggest a scheduler configured to transfer, when the size of the traffic exceeds the number of tokens stored in the first bucket, an appropriate number of tokens from the second bucket to the first bucket so that the first bucket includes a number of tokens that equals or exceeds the size of the traffic. The Examiner admits that CHANDRAN does not disclose this feature and relies on col. 5, lines 39-

54, and col. 8, lines 10-23, of FAN et al. for allegedly disclosing this feature (Office Action, pp.
4-5). Applicants disagree.

Col. 5, lines 39-54, of FAN et al. is reproduced above. This section of FAN et al.
discloses a scheduler that operates under at least three modes: (1) a full available rate mode, (2) a
minimum guaranteed rate mode, and (3) a halt transmission mode. This section of FAN et al. in
no way discloses or suggests that the scheduler transfers, when the size of the traffic exceeds the
number of tokens stored in the first bucket, an appropriate number of tokens from the second
bucket to the first bucket so that the first bucket includes a number of tokens that equals or
exceeds the size of the traffic, as required by claim 16. In fact, this section of FAN et al. in no
way relates to transferring tokens or token buckets.

Col. 8, lines 10-23, of FAN et al. is reproduced above. This section of FAN et al.
discloses that a pool of excess bandwidth can be made available to streams that transmit in
excess of their minimum rates. This section of FAN et al. in no way discloses or suggests a
scheduler that transfers, when the size of the traffic exceeds the number of tokens stored in the
first bucket, an appropriate number of tokens from the second bucket to the first bucket so that
the first bucket includes a number of tokens that equals or exceeds the size of the traffic, as
required by claim 16. In fact, this section of FAN et al. in no way relates to transferring tokens
or token buckets.

For at least the foregoing reasons, Applicants submit that claim 16 is patentable over
CHANDRAN and FAN et al., whether taken alone or in any reasonable combination.

Claims 17-19 depend from claim 16. Therefore, these claims are patentable over
CHANDRAN and FAN et al., whether taken alone or in any reasonable combination, for at least

the reasons given above with respect to claim 16. Moreover, these claims recite additional features not disclosed or suggested by CHANDRAN and FAN et al.

For example, claim 16 recites that the scheduler causes the traffic to be forwarded after the transfer. The Examiner relies on col. 5, line 61, to col. 6, line 7, of CHANDRAN for allegedly disclosing this feature (Office Action, pg. 5). Applicants disagree.

At the outset, it is unclear how the Examiner can reasonably rely on CHANDRAN for disclosing a scheduler that causes the traffic to be forwarded after the transfer, when the Examiner admits that CHANDRAN does not disclose a scheduler that transfers, when the size of the traffic exceeds the number of tokens stored in the first bucket, an appropriate number of tokens from the second bucket to the first bucket so that the first bucket includes a number of tokens that equals or exceeds the size of the traffic.

Nevertheless, col. 5, line 61, to col. 6, line 7, of CHANDRAN is reproduced above. This section of CHANDRAN discloses that interface token bucket 101, reserved token bucket 103, and peak token bucket 105 can be refreshed. This section of CHANDRAN in no way discloses or suggests a scheduler that causes the traffic to be forwarded after the scheduler transfers, when the size of the traffic exceeds the number of tokens stored in the first bucket, an appropriate number of tokens from the second bucket to the first bucket so that the first bucket includes a number of tokens that equals or exceeds the size of the traffic, as required by claim 17.

For at least these additional reasons, Applicants submit that claim 17 is patentable over CHANDRAN and FAN et al., whether taken alone or in any reasonable combination.

Independent claim 20 recites features similar to features recited above with respect to claim 16. Therefore, this claim is patentable over CHANDRAN and FAN et al., whether taken

alone or in any reasonable combination, for reasons similar to reasons given above with respect to claim 16.

Claims 21 and 22 depend from claim 20. Therefore, these claims are patentable over CHANDRAN and FAN et al., whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 20.

Claims 7-10, 12, and 13 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over CHANDRAN in view of FAN et al., and further in view of TROXEL. Applicants respectfully traverse.

Claims 7-10, 12, and 13 depend from claim 1. The disclosure of TROXEL does not remedy the deficiencies in the disclosures of CHANDRAN and FAN et al. set forth above with respect to claim 1. Therefore, these claims are patentable over CHANDRAN, FAN et al., and TROXEL, whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 1.

Claim 4 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over CHANDRAN in view of FAN et al., and further in view of TROXEL and Applicants' admitted prior art. Applicants respectfully traverse this rejection.

Claim 4 depends from claim 1. The disclosure of TROXEL and the alleged admitted prior art do not remedy the deficiencies in the disclosures of CHANDRAN and FAN et al. set forth above with respect to claim 1. Therefore, claim 4 is patentable over CHANDRAN, FAN et al., TROXEL, and the alleged admitted prior art, whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 1.

Claim 11 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over

CHANDRAN in view of FAN et al., and further in view of TROXEL and MAKRUCKI.
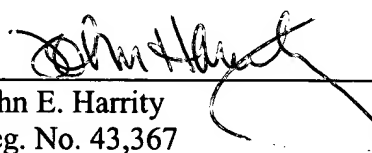Applicants respectfully traverse this rejection.

Claim 11 depends from claim 1. The disclosures of TROXEL and MAKRUCKI do not remedy the deficiencies in the disclosures of CHANDRAN and FAN et al. set forth above with respect to claim 1. Therefore, Applicants submit that claim 11 is patentable over CHANDRAN, FAN et al., TROXEL, and MAKRUCKI, whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 1.

In view of the foregoing remarks, Applicants respectfully request the Examiner's reconsideration of the application and the timely allowance of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is

hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

including extension of time fees, to Deposit Account No. 50-1070 and please credit any excess

fees to such deposit account.

Respectfully submitted,

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